

STATE OF ALASKA

Bill Sheffield, Governor

Annual Performance Report for

CHINOOK SALMON POPULATION AND ANGLER USE
STUDIES OF NORTHERN COOK INLET WATERS

by

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TABLE OF CONTENTS

Study:	G-II SPORT FISH STUDIES	Page
Job:	G-II-M Chinook Salmon Population and Angler Use Studies of Northern Cook Inlet Waters by: Kelly R. Hepler and Robert W. Bentz	
Abstract.		150
Key Words		150
Background.		150
Recommendations		152
Objectives.		152
Techniques Used		154
Findings.		154
Northern Cook Inlet Chinook Salmon Sport Fishery		154
Management Recommendations		171
Literature Cited.		171

LIST OF TABLES AND FIGURES

Figure	1. Northern Cook Inlet area.	151
Table	1. List of common names, scientific names and abbreviations	153
Table	2. Chinook salmon sport harvest and effort estimates for northern Cook Inlet, 1979-1984.	155
Table	3. Chinook salmon sport harvest per angler-day estimates for northern Cook Inlet, 1979-1984.	159
Table	4. Access methods during chinook salmon sport fishery on Deshka River, Alexander Creek, Lake Creek, Chuitna River and Peters Creek, 1984.	161
Table	5. Percentages of the guided and chartered anglers during the chinook salmon sport fishery on the Deshka River, Alexander Creek, Lake Creek, Chuitna River and Peters Creek, 1984.	162
Table	6. Chinook salmon age class frequency from the sport fish harvest for northern Cook Inlet, 1979-1984	166
Table	7. Chinook salmon age class frequency from the sport fish harvest for Deshka River, Alexander Creek, Lake Creek, Chuitna River, Peters Creek and Talachulitna River, 1979-1984	166
Table	8. Chinook salmon age class frequency from the sport fish harvest for Caswell Creek, Chunitna Creek, Little Susitna River, Montana Creek and Willow Creek, 1979-1984.	167
Table	9. Chinook salmon mean fork lengths and sex ratios by age class from the sport fish harvest for northern Cook Inlet, 1984	167
Table	10. Chinook salmon escapement counts for northern Cook Inlet, 1976-1984	168
Table	11. Chinook salmon observed and estimated escapement counts for northern Cook Inlet, 1973-1984	170

TABLE OF CONTENTS (CONT'D)

Page

Table 24.	Summary of chinook salmon captured for blood chemistry analysis, Kenai River, 1984	132
Table 25.	Blood chemistry values for chinook salmon at initial sampling, Kenai River, 1984	134
Table 26.	Blood chemistry values for chinook salmon over a holding period in a live pen, Kenai River, 1984	135
Figure 16.	Plasma glucose response in chinook salmon during a holding period after capture by hook and line or drift net, Kenai River, 1984.	136
Figure 17.	Plasma chloride response in chinook salmon during a holding period after capture by hook and line or drift net, Kenai River, 1984.	137
Figure 18.	Plasma cortisol response in chinook salmon during a holding period after capture by hook and line or drift net, Kenai River, 1984.	138
Table 27.	Summary of blood chemistry response of three chinook salmon rehooked and played to exhaustion after undergoing the holding/sampling process, Kenai River, 1984 .	140
Table 28.	Relationship of hemastix reaction intensity and time elapsed from initial encounter for chinook salmon captured by hook and line or drift net in the Kenai River, 1984	141

RESEARCH PROJECT SEGMENT

State: Alaska

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Job Title: Chinook Salmon
Population and
Angler Use Studies
of Northern Cook
Inlet Waters

Cooperators: Kelly R. Hepler and Robert W. Bentz

Period Covered: July 1, 1984 to June 30, 1985

ABSTRACT

In 1984, for the sixth consecutive year, selected northern Cook Inlet streams were opened to sport fishing for chinook salmon, *Oncorhynchus tshawytscha* (Walbaum). The 1984 chinook salmon harvest and effort estimates were the highest recorded since the fisheries were reopened in 1979. The total estimated chinook salmon escapement count for northern Cook Inlet was the highest recorded since 1977.

KEY WORDS

Northern Cook Inlet, chinook salmon, creel census, escapement counts.

BACKGROUND

For the sixth consecutive year, selected northern Cook Inlet streams were opened to the taking of chinook salmon 20 inches or more in length. In the past, fishing was permitted on three streams on the west side of the Susitna River, four on the east side of Susitna River, and Little Susitna River which drains directly into Cook Inlet. In 1983, the Board of Fisheries expanded the areas open to fishing to include the Chuitna River near Tyonek and the entire Yentna and Talkeetna River drainages (Figure 1). The opening date for the season was also changed from the fourth Saturday in May to January 1. In 1984, the Board of Fisheries opened the remaining coastal streams of west Cook Inlet north of the West Foreland. For reporting purposes reference to west side streams will include all streams west of the Susitna River, and east side streams will include all streams east of the Susitna River which flow into northern Cook Inlet.

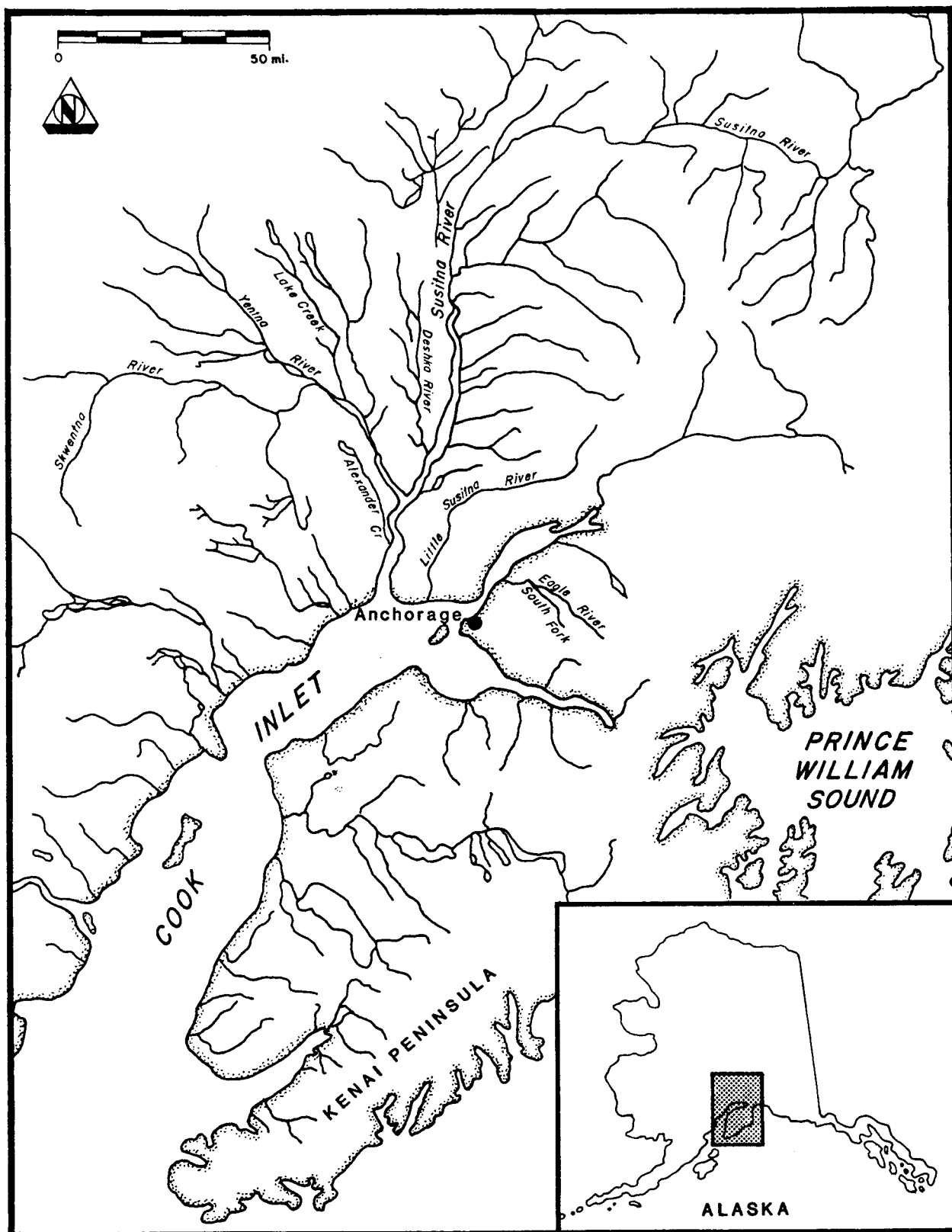


Figure 1. Northern Cook Inlet area.

A chinook salmon/steelhead stamp was not required in 1984 but a nontransferable harvest record was once again mandatory for participation in these fisheries. A five fish (20 inches or more in length) yearly bag limit also continued to govern the annual take from all Cook Inlet chinook salmon fisheries. In 1979, the northern Cook Inlet daily bag and possession limit was one chinook 20 inches or more in length. The following year the daily bag and possession limit was changed to two chinook salmon, one of which could exceed 28 inches. In 1981, the daily limit was changed to one chinook 20 inches or more in length and two in possession. This regulation remained in effect for 1984.

The 1984 fisheries were monitored closely for enforcement purposes and to collect data such as angling effort, harvest, sex and age composition. Table 1 includes a list of common and scientific names of all species included in this report.

Other pertinent historical data are presented in Annual Performance Reports by Kubik (1980-1981), Hepler and Kubik (1982), Delaney and Hepler (1983), Watsjold (1980-1981), Bentz (1982-1983) and Hepler and Bentz (1984).

RECOMMENDATIONS

1. A creel census should be continued on selected northern Cook Inlet streams to determine sport angling effort, obtain harvest estimates and collect biological data from the chinook salmon fisheries.
2. Chinook salmon enumerations should be continued on selected northern Cook Inlet streams to ascertain the abundance, timing and distribution of chinook salmon escapement in the spawning streams.
3. Chinook salmon carcass surveys should be continued to provide a comparative source of biological data including age, length and sex composition.

OBJECTIVES

1. To determine sport fish effort for, and harvest of chinook salmon from late May to early July on nine northern Cook Inlet streams.
2. To determine escapement levels of chinook salmon stocks in up to 22 northern Cook Inlet streams between July 15 and August 15.
3. To determine biological characteristics of chinook salmon stocks in four northern Cook Inlet streams in early August.
4. To evaluate current regulations governing the chinook salmon sport fisheries and provide recommendations for future management and research.

Table 1. List of common names, scientific names and abbreviations.

Common Name	Scientific Name and Author	Abbreviation
Chinook salmon	<i>Oncorhynchus tshawytscha</i> (Walbaum)	KS

TECHNIQUES USED

Techniques utilized in the 1984 field season are described by Bentz (1983), Delaney and Hepler (1983) and Hepler and Bentz (1984). The only differentiations from techniques previously described were additional creel census questions pertaining to charters, guides and access methods on west side Susitna River streams, and boat and motor size and type on east side streams.

FINDINGS

Northern Cook Inlet Chinook Salmon Sport Fishery

Low, clear water conditions and favorable numbers of chinook salmon contributed to a record number of anglers on northern Cook Inlet streams in 1984. The total chinook salmon harvest on northern Cook Inlet streams in 1984 was estimated at 16,586 with 47,977 days of angler effort, which is the highest recorded since 1979 (Table 2). Harvests of 4,868 and 11,718 chinook salmon from east and west side streams, respectively, were record highs for both areas.

It is important to recognize that these data are not always directly comparable between streams and from year to year because emergency closures on east side streams have influenced both effort and harvest. Willow Creek illustrates the effect of annual fluctuations in fishing time. For example, in 1979, 8 days of fishing provided a harvest of 285 chinook and 975 angler-days of effort. Seven days of fishing yielded nearly the same number of salmon (292) in 1980 and, in 1984, 805 chinook were caught in 1,939 angler-days of effort during an 8-day season.

Harvest and effort data for the west side systems are generally more comparable from year to year because, unlike the east side, seasons have not been shortened by emergency closures. Changes in areas opened to fishing and alterations in bag and possession limits have, however, had some influence on annual harvests from these streams.

The following is a review of the 1984 chinook salmon sport fishery for individual streams within northern Cook Inlet.

Little Susitna River:

Since the area open to chinook salmon fishing on the Little Susitna River encompasses 70 miles, it was necessary to conduct a creel census at both major access sites which are 42 river miles apart. These access points are referred to as the Burma Road and Parks Highway, which access the lower and upper river, respectively. Total chinook salmon harvest was estimated at 1,476 with 16,192 angler-days of effort and an average harvest per hour and per angler-day of 0.02 and 0.09, respectively. Fishing effort in 1984 increased 77% while the chinook harvest increased 82% over 1983 and represents the highest effort since the river was reopened to fishing in 1979 (Table 2). Boat anglers harvested 64% of the chinook and represented 33% of the total effort in 1984.

Table 2. Chinook salmon sport harvest and effort estimates for northern Cook Inlet, 1979-1984.

	Harvest						Angler-Days					
	1979	1980	1981	1982	1983	1984	1979	1980	1981	1982	1983	1984
<u>East Side</u>												
Caswell Creek	155	255 ^{1/}	185	220	215 ^{5/}	378	1,070	1,038	1,320	1,225	1,802	2,487
Clear Creek	358	161	340	441	1,048 ^{5/}	1,323	1,160	801	1,300	1,764	2,799	3,730
Little Susitna R.	728	337	945 ^{3/}	792	813 ^{5/}	1,476	3,857	2,877	6,660	7,185	9,137	16,192
Montana Creek	125	375 ^{1/}	360 ^{3/}	85	311 ^{5/}	886	2,470	1,901	4,845	897	1,433	3,317
Willow Creek	285	292 ^{2/}	345 ^{4/}	390	393	805	975	612	540	504	1,811	1,931
Total	1,651	1,420	2,175	1,928	2,780	4,868	9,532	7,229	14,665	11,575	16,982	27,657
<u>West Side</u>												
Alexander Creek	1,277	2,281	630	2,252	1,830	1,830	2,778	4,411	1,714	4,735	5,440	3,674
Deshka River	2,954	4,023	1,895	4,000	2,802	4,652	6,451	8,397	5,086	7,843	5,462	7,426
Lake Creek	2,045	1,044	641	1,474	2,141	2,148	3,954	2,237	1,180	3,657	4,203	3,134
Chuitna River	7/	7/	7/	7/	1,052	1,132	7/	7/	7/	7/	2,364	1,743
Talachulitna River	7/	7/	7/	7/	312	320	7/	7/	7/	7/	1,198	1,300
Peters/Martin Creek	7/	7/	7/	7/	114	336	7/	7/	7/	7/	267	543
Lewis/Theodore R.	8/	8/	8/	8/	8/	850	8/	8/	8/	8/	8/	1,600
Other Streams	8/	8/	8/	8/	8/	450	8/	8/	8/	8/	8/	900
Total	6,276	7,348	3,166	7,726	8,251	11,718	13,183	15,045	7,980	16,235	18,934	20,320
Combined Totals	7,927	8,768	5,341	9,654	11,031	16,586	22,715	22,274	22,645	27,810	35,916	47,977

1/ In 1980 emergency closure reduced fishing days from a scheduled 8 to 5.

2/ In 1980 emergency closure reduced fishing days from a scheduled 8 to 7.

3/ In 1981 emergency closure reduced fishing days from a scheduled 8 to 5.

4/ In 1981 emergency closure reduced fishing days from a scheduled 8 to 6.

5/ Talkeetna River drainage, including Clear Creek.

6/ In 1983 emergency closure reduced fishing days from a scheduled 8 to 6.

7/ Chinook salmon sport fishery was not opened until 1983.

8/ Chinook salmon sport fishery was not opened until 1984.

Anglers interviewed at the Burma Road access site harvested 1,015 chinook salmon in 10,012 angler-days, which represented 69 and 62% of the respective total harvest and effort. Harvest per hour and per angler-day was 0.02 and 0.10, respectively. Anglers in boats fished 3,753 days and harvested 681 chinook while shore anglers harvested 334 chinook in 6,259 angler-days. Included in these estimates are anglers which floated from the Parks Highway to the Burma Road. These anglers harvested 52 chinook salmon in 730 angler-days of effort, which represents 3.5 and 4.5% of the river's respective harvest and effort totals. Twenty-four percent of these anglers utilized a small outboard motor on their boat while the remainder floated in canoes or inflatable rafts without motors. Although boat anglers who launched from the Burma Road access site utilized six different types of boats, 85% of these anglers used small, lightweight boats powered by outboard motors with propellers.

Anglers who boated across the marine waters of Knik Arm from Anchorage during high tide to fish in the lower river harvested 29 chinook salmon during 389 angler-days, 2% of the harvest and effort totals. This represents a decrease from 1983 harvest and effort levels of 5 and 4%, respectively (Hepler and Bentz, 1984). Harvest per hour and angler-day in 1984 was 0.01 and 0.08, respectively. Seventy percent of these anglers utilized boats powered by large outboard motors with propellers. The remainder traveled in boats with inboard jet units.

Parks Highway anglers harvested 432 chinook with 5,791 angler-days of effort. These figures represent 29 and 36% of the respective harvest and effort totals for the entire river. Boat anglers harvested 231 chinook salmon in 1,295 angler-days while shore anglers fished 4,496 days and harvested 201 chinook.

Anglers utilizing charter boat services based at the Parks Highway access site have increased substantially in recent years. Sport fishing effort by chartered anglers rose from 17% in 1983 (Hepler and Bentz, 1984) to 28% of the total Parks Highway boat fishing effort in 1984. Chinook salmon harvested by chartered anglers increased from 21 to 45% from 1983 to 1984, respectively, for all chinook taken by boat anglers in the upper river. These anglers were usually transported to a downstream fishing area, dropped off and picked up again later in the day, although charter operators would occasionally remain with their clients and guide them to different areas. All charter boats utilized at the Parks Highway were powered by large outboard motors with jet units. Chinook harvest per angler-day by chartered boat anglers in 1984 was 0.29 and harvest per hour was 0.04.

Private boat anglers comprised 72% of the effort and 55% of the harvest by boat anglers in the upper river. Their harvest per angler-day and per hour was 0.14 and 0.03, respectively, which was slightly less than chartered anglers. Private boat anglers utilized six different types of boats ranging from canoes to inboard jets, with predominant boat type powered by a large outboard motor with a jet unit.

Talkeetna River:

Total chinook salmon harvest on the Talkeetna River in 1984 was estimated at 1,323 with 3,730 angler-days of effort and an average harvest per hour and per angler-day of 0.07 and 0.36, respectively. These estimates represent the highest harvest and effort since the fishery was reopened in 1979.

In 1983, the entire Talkeetna River drainage was opened to sport fishing for chinook salmon. During previous years only Chunilna Creek, a tributary stream of the Talkeetna River, was open to chinook fishing. Although the entire drainage was open in 1984, nearly all of the harvest and effort occurred at Chunilna Creek. Census data indicate over 99% of both the chinook harvest and effort took place within Chunilna Creek or at the stream's confluence with the Talkeetna River.

Anglers who chartered boats from Talkeetna comprised 49% of the total fishing effort and harvested 40% of all chinook salmon taken in 1984, which is comparable with 1983 charter estimates. Chinook salmon harvest rates for chartered anglers was 0.05 fish per hour and 0.29 fish per angler-day. Most of these anglers were transported upstream to Chunilna Creek, dropped off and picked up again later in the day, although charter operators would sometimes remain with their clients and guide them to different streams flowing into the Talkeetna River.

Anglers fishing from private boats totaled 51 and they took 60% of the respective chinook effort and harvest on the Talkeetna River in 1984. Their harvest rate was 0.09 fish per hour and 0.42 fish per angler-day, which was higher than the chartered anglers' harvest rate.

Willow Creek:

The total chinook salmon harvest at Willow Creek, a weekend-fishing-only stream, was estimated at 805 with 1,931 angler-days of effort in 1984. When compared with years prior to 1983 (Table 2), effort in 1984 increased while the harvest per angler-day decreased. These fluctuations are a result of an intense fishery at the Parks Highway area during the last weekend of the chinook season the past 2 years. In 1984, nearly 1,200 angler-days of effort were estimated during these 2 days with a harvest of 239 chinook. Harvest per angler-day was 0.20. Harvest and effort estimates at the mouth of Willow Creek, where nearly all fishing effort has occurred in past years, increased slightly in comparison with previous years. Anglers expended 736 angler-days of effort and harvested 566 chinook for a harvest per angler-day of 0.77.

Prior to 1984, only boat anglers could reach the mouth of Willow Creek. New road construction enabled bank anglers to walk to this fishery for the first time during the 1984 chinook season. These anglers comprised 12% of the effort and harvested 13% of the chinook taken at the mouth of Willow Creek.

Seventy-eight percent of all anglers that fished at the mouth of Willow Creek utilized the Willow Creek highway bridge launch site. The

remaining 22% used the Susitna Landing and Little Willow Creek bridge access points. Anglers who chartered to the mouth comprised 56% of the boat angler effort and harvested 56% of chinook salmon taken at the mouth in 1984. All of these anglers were taken down Willow Creek from the highway bridge, dropped off and picked up again later in the day or at the end of the weekend. Nearly all chartered anglers were transported by either inboard jets or airboats.

Private boat anglers accounted for 44% of the chinook salmon harvest and effort aspended at the Willow Creek mouth by all boat anglers. Fifty-one percent of these anglers used the Willow Creek bridge access site, while 45% utilized the Susitna Landing. The remaining 4% launched from the Little Willow Creek highway bridge. Private boat anglers utilized six different types of boats. The predominant boat type was powered by a large outboard motor with a jet unit.

Chartered anglers experienced harvest rates of 0.18 and 0.75 chinook salmon per hour and per day, respectively. Private boat anglers achieved slightly higher harvest rates of 0.23 chinook per hour and 0.77 per angler-day.

Montana Creek:

The total chinook salmon harvest at Montana Creek, a weekend-fishing-only stream, was estimated at 886 with 3,317 angler-days of effort in 1984. Harvest per hour and per angler-day averaged 0.07 and 0.27, respectively.

The chinook harvest increased 185% over the estimated harvest in 1983 and is the highest since Montana Creek was reopened to fishing in 1979.

Caswell Creek:

The total chinook salmon harvest at Caswell Creek, a weekend-fishing-only stream, was estimated at 378 with 2,487 angler-days of effort in 1984. Chinook salmon harvest per hour and per angler-day averaged 0.03 and 0.15, respectively.

Budget limitations precluded a complete creel census at Caswell Creek in 1984. Harvest and effort estimates for this stream were derived through periodic inspections of the fishery several times a day throughout the fishing season. Biological data were not obtained from Caswell Creek chinook.

Deshka River:

The Deshka River was open to chinook salmon fishing from its mouth upstream 31 river miles to the confluence of Moose and Kroto Creeks. An estimated 4,652 chinook were harvested in 7,426 days of angler effort. The 1984 estimates represent a 66% increase in harvest and a 36% increase in effort from the 1983 estimates, and were the highest since the fishery reopened in 1979 (Table 2). Anglers enjoyed a harvest rate of 0.63 chinook per angler-day, which also represents the highest harvest rate since the fishery reopened in 1979 (Table 3).

Table 3. Chinook salmon sport harvest per angler-day estimates for northern Cook Inlet, 1979-1984.

	Harvest per Angler-Day					
	1979	1980	1981	1982	1983	1984
<u>East Side</u>						
Caswell Creek	0.14	0.25	0.14	0.18	0.12	0.15
Clear Creek	0.31	0.20	0.26	0.25	0.37	0.36
Little Susitna R.	0.19	0.12	0.14	0.11	0.09	0.09
Montana Creek	0.05	0.20	0.07	0.09	0.22	0.27
Willow Creek	<u>0.29</u>	<u>0.48</u>	<u>0.64</u>	<u>0.77</u>	<u>0.22</u>	<u>0.42</u>
Total	0.17	0.20	0.15	0.17	0.16	0.18
<u>West Side</u>						
Alexander Creek	0.46	0.52	0.48	0.37	0.34	0.50
Deshka River	0.46	0.48	0.37	0.51	0.51	0.63
Lake Creek	0.52	0.47	0.35	0.40	0.51	0.69
Chuitna River	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.45	0.65
Talachulitna R.	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.26	0.25
Peters/Martin Creek	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.43	0.62
Lewis/Theodore R.	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	0.53
Other Streams	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>0.50</u>
Total	0.48	0.49	0.37	0.47	0.44	0.58
Combined Totals	0.35	0.39	0.24	0.35	0.31	0.35

1/ Chinook salmon sport fishery was not opened until 1983.

2/ Chinook salmon sport fishery was not opened until 1984.

As in 1983, large numbers of chinook were available to anglers in the lower reaches of the Deshka River early in the season. Over 70% of the fishing effort and harvest occurred by the end of the first week in June, while the chinook were migrating through the lower reaches of the Deshka River.

After the middle of June when harvest rates decreased in the lower river, anglers enjoyed increasingly better fishing in the upper reaches. As in 1983, low water conditions precluded riverboat travel to the upper reaches, except for shallow draft boats such as airboats. The major access method for anglers to the upper reaches of the Deshka River was float plane landings at Neil Lake (Table 4). Data collected at Neil Lake indicate that 96% of the interviewed anglers utilized float planes to gain access to the upper reaches of the Deshka River, while 3% utilized rafts, and only 1% utilized riverboats. These figures differ drastically from the overall Deshka River access figures which indicate that 74 and 20% of access originates from riverboats and float planes, respectively. It is also interesting to note that only 12% of the overall Deshka River anglers utilized chartered access, whereas over 80% of the anglers fishing in the Neil Lake area utilized chartered access (Table 5).

Alexander Creek:

Alexander Creek was open to chinook fishing from its mouth upstream to Alexander Lake. An estimated 1,830 chinook were harvested in 3,674 days of angler effort. The 1984 harvest was identical to the 1983 harvest, whereas angler effort decreased 33% from the 1983 estimate. The harvest rate of 0.50 chinook per angler-day increased from the 1983 harvest rate of 0.34.

Fishing was once again excellent the first 3 weeks of the season on Alexander Creek. Angler effort and harvest expended during the first 3 weeks accounted for over 70% of the total season estimates. The development of the chinook salmon fishery on Alexander Creek mirrors the Deshka River fishery. Early in the season large numbers of chinook are traveling through the lower reaches of Alexander Creek and the harvest rate remains high, but from mid-June until the end of the season the chinook are only available in the upper reaches, and the harvest rates drop off in the lower reaches. Low water conditions reduced riverboat traffic in 1984, as in 1983. A greater percentage of the anglers are guided on Alexander Creek than the Deshka River and, whereas anglers may still continue to charter to the mouth area of Deshka River later in the season when there is a paucity of chinook, guided anglers on Alexander Creek will follow the chinook migration to the upper reaches near the outflow of Sucker Creek. The greatest percentage of harvest and effort occurred at the Sucker Creek area during the last week of the season. Anglers interviewed at Sucker Creek indicated that 45% obtained access by riverboats and 55% were rafters from Alexander Lake. These figures differ from the overall Alexander Creek figures which indicate that anglers utilized 31% riverboats, 62% float planes and 7% wheel planes. Alexander Creek had the highest percentage of guided anglers on the west side with 17%, and also one of the highest chartered percentages with 51% (Table 5).

Table 4. Access methods during chinook salmon sport fishery on Deshka River, Alexander Creek, Lake Creek, Chuitna River and Peters Creek, 1984.

Location	Access Methods and Percentages			
	Riverboat	Float Plane	Wheel Plane	Vehicle
Deshka River	74	20	4	2
Neil Lake*	1	96	0	3**
Alexander Creek	31	62	7	0
Sucker Creek***	45	55****	0	0
Lake Creek	27	68	5	0
Chuitna River*****	0	0	55	45
Peters Creek	<u>0</u>	<u>0</u>	<u>0</u>	<u>100</u>
Combined	38	47	8	7

* Neil Lake is located approximately 25 miles upstream from the mouth of the Deshka River.

** Vehicle was utilized to transport anglers to tributary of Deshka River and then a raft was used for transportation to Neil Lake.

*** Sucker Creek is located approximately 25 miles upstream from the mouth of Alexander Creek.

**** Floatplane was utilized to transport anglers to Alexander Lake and then a raft was used for transportation to the confluence of Sucker Creek and Alexander Creek.

***** Chuitna River area is not accessible by major road systems and vehicles must be barged in or travel across an ice bridge on the Susitna River.

Table 5. Percentages of the guided and chartered anglers during the chinook salmon sport fishery on the Deshka River, Alexander Creek, Lake Creek, Chuitna River and Peters Creek, 1984.

Location	Percent of Guided Anglers	Percent of Chartered Anglers
Deshka River	3	12
Neil Lake*	1	80
Alexander Creek	17	51
Sucker Creek**	17	52
Lake Creek	12	59
Chuitna River	10	34
Peters Creek	0	0
Combined Totals	10	42

* Neil Lake is a favorite access point for anglers on the Deshka River.

** Confluence of Sucker Creek and Alexander Creek is a favorite fishing area on Alexander Creek.

Western Northern Cook Inlet:

In 1984, the entire western northern Cook Inlet (WNCI) opened to sport fishing for chinook salmon. During the previous year only the Chuitna River was open to chinook fishing. Total chinook harvest from WNCI was estimated at 2,132 with 3,643 days of angler effort.

Although the entire WNCI was open to chinook salmon fishing in 1984, over 90% of the harvest and effort occurred on the Chuitna, Lewis and Theodore Rivers. The remaining angler effort and harvest occurred on small clear water tributaries of Beluga and Chakachatna Rivers.

Chuitna River:

Chuitna River, near Tyonek, was opened to chinook salmon sport fishing, from tide water to a point 1/4 mile downstream from Lone Creek in 1984. Total chinook salmon harvest on the Chuitna River in 1984 was 1,132 with 1,743 days of angler effort. The 1984 harvest estimates increased only slightly from the 1983 harvest, whereas the angler effort in 1984 decreased by 26% from the 1983 estimate. Anglers enjoyed an exceptionally high harvest of 0.65 chinook per angler-day in 1984, which was a large increase from the 1983 harvest rate of 0.45.

The first chinook was caught the first week of June and the fishery built quickly reaching a peak during the second and third weeks of June. Sixty-eight and 77% of the respective harvest and effort occurred during this 2-week period, which was very similar to the 1983 fishery (Hepler and Bentz, 1984).

Wheel plane was the major access method for Chuitna River anglers, followed by vehicle.

Lewis and Theodore Rivers:

The total chinook salmon harvest on Lewis and Theodore Rivers was estimated at 850 chinook with 1,600 angler-days of effort in 1984. Chinook salmon harvest per angler-day averaged 0.53.

Budget limitations precluded a complete census at Lewis and Theodore Rivers in 1984. Harvest and effort estimates for these streams were derived through periodic inspections of the fishery several times a day throughout the fishing season.

Anglers gain access to Lewis and Theodore Rivers by vehicle from the Standard Oil Road and wheel plane. A large reach of the Theodore River is paralleled by the road system and affords the anglers better access throughout the fishery, as compared to Lewis River where the majority of effort occurs below the Standard Oil bridge crossing downstream to tide water.

Yentna River:

In 1984, the entire Yentna River drainage was opened to sport fishing for chinook salmon.

Total chinook harvest on the Yentna River drainage in 1984 was estimated at 3,104 with 5,577 days of angler effort. When compared with 1983, the effort decreased by 10%, but the harvest rate increased from 0.46 in 1983 to 0.56 chinook per angler-day in 1984.

As in 1983, Lake Creek, Talachulitna River and Peters Creek accounted for 90% of the total harvest and effort for the Yentna River drainage. Lake Creek accounted for 69 and 63% of the respective total harvest and effort for these three streams. The remaining angler effort and chinook harvest occurred on small, clear-water tributaries of the Yentna River.

Lake Creek:

Total chinook salmon harvest on Lake Creek was estimated at 2,148 with 3,134 days of angler effort. The harvest estimate was the highest since the fishery was reopened in 1979, but the effort estimate decreased 25% from the 1983 estimate. The exceptionally high harvest rate of 0.69 chinook per angler-day was the highest of any northern Cook Inlet stream since the fishery reopened in 1979. The peak fishing period on Lake Creek was once again between June 10 and June 20. This period accounted for over 60% of harvest and effort for the season.

Lake Creek had the highest overall float plane use for access (68%) and chartered anglers (59%) of all the major rivers in the west side Susitna area (Tables 4 and 5).

Talachulitna River:

The total chinook salmon harvest on Talachulitna River was estimated at 320 with 1,300 days of angler effort. The 1984 harvest and effort estimates compare closely to the 1983 estimates. The peak fishing period on Talachulitna River occurred between June 25 and July 6. The majority of angler effort occurs in the lower mile of the Talachulitna River, but there is a growing increase in the number of floaters on the upper reaches during the chinook salmon season.

Budget limitations precluded a complete census at the Talachulitna River in 1984. Harvest and effort estimates for this stream were derived through periodic inspections of the fishery throughout the fishing season.

Peters Creek:

In 1984, the total chinook salmon harvest on Peters Creek was 336 with 543 days of angler effort. These estimates represent an increase of 195 and 103% of harvest and effort, respectively, from the 1983 estimates. The large increases in angler effort and harvest can be attributed to an increase in angler awareness of the chinook salmon fishing opportunities on Peters Creek.

Peters Creek differs from the other west side Susitna streams because it is road accessible. Accordingly, vehicles were the only access method. Peters Creek was also the only stream in the west side Susitna River area without any guided anglers in 1984.

Population Structure:

Scales were collected from all chinook salmon over 20 inches in length and age determined by scale analysis. Age 1.3 fish, which comprised 44% of the northern Cook Inlet sport fish harvest, was the dominant age class in 1984. This represented an increase of 10% from the 1983 returns (Table 6). The strong showing of Age 1.3 fish in 1984 and Age 1.2 in 1983 indicate good survival from the 1979 parent year. It is anticipated that the strong returns from the 1979 parent year will continue into 1985 with the Age 1.4 returns. The 1976 parent year exhibited a similar pattern with strong Age 1.2 and Age 1.3 returns in 1980 and 1981, respectively, and followed through with strong returns of Age 1.4 in 1982.

The changes in chinook salmon age structure for west side and east side Susitna River streams from 1979 to 1984 are listed in Tables 7 and 8, respectively.

The west side Susitna River streams age class structure was similar to previous years. Age 1.3 chinook were dominant followed by Age 1.4 chinook and Age 1.2 chinook.

Age 1.4 chinook were once again the dominant age for east side Susitna River streams. Age 1.2 chinook represented the lowest recorded percentage since the fishery was reopened in 1979. Conversely, Age 1.3 chinook showed the strongest return since 1979.

It is important to note that a small percentage of Age 0.3, 0.4 and 1.5 chinook are collected each year. These age groups are not included in the tables because they comprise such a small percentage of the total.

Table 9 indicates the overall sex ratio for aged chinook salmon from the sport fish harvest was 1.3 males to 1.0 females. This figure is consistent with sex ratios from previous sport fish harvests. The sport fish harvest is dominated by males because females only return as Age 1.3 and 1.4 adults, whereas males are represented in all the dominant age classes; 1.2, 1.3 and 1.4.

In past years, the male-to-female sex ratio for chinook salmon spawning populations were obtained from carcass surveys. Carcass surveys were not conducted on northern Cook Inlet streams in 1984 due to budget constraints and project priorities.

Escapements:

Results of chinook salmon escapement surveys on northern Cook Inlet streams revealed excellent escapements (Table 10). The total estimated observed count was the highest recorded since 1977 (Table 11). Eight east side Susitna River streams experienced record returns and the combined east side Susitna River counts are higher than any previous year. West side Susitna River streams did not produce record escapements as did the east side Susitna River streams, but did experience escapements that fell within the last 9-year average.

Table 6. Chinook salmon age class frequency from the sport fish harvest for northern Cook Inlet, 1979-1984.

Year	Sample Size	Age Group by Percent		
		1.2	1.3	1.4
1979	1,146	13	36	51
1980	991	30	33	37
1981	739	20	44	36
1982	1,408	16	32	52
1983	2,225	25	40	35
1984	<u>2,551</u>	<u>15</u>	<u>44</u>	<u>41</u>
Combined	9,060	20	39	41

Table 7. Chinook salmon age class frequency from the sport fish harvest for Deshka River, Alexander Creek, Lake Creek, Chuitna River*, Peters Creek* and Talachulitna River**, 1979-1984.

Year	Sample Size	Age Group by Percent		
		1.2	1.3	1.4
1979	516	9	56	35
1980	293	13	55	32
1981	300	13	57	30
1982	722	17	40	43
1983	1,329	21	46	33
1984	1,463	17	47	36

* Age class data only available for 1983 and 1984.

** Age class data only available for 1983.

Table 8. Chinook salmon age class frequency from the sport fish harvest for Caswell Creek*, Chunilna Creek**, Little Susitna River, Montana Creek and Willow Creek, 1979-1984.

Year	Sample Size	Age Group by Percent		
		1.2	1.3	1.4
1979	630	16	20	64
1980	698	38	24	38
1981	439	25	35	40
1982	686	16	23	61
1983	896	30	30	40
1984	1,113	13	40	47

* Age class data not available for 1982-1983.

** Includes age class data from Talkeetna River drainage for 1983.

Table 9. Chinook salmon mean fork lengths and sex ratios by age class from the sport fish harvest for northern Cook Inlet, 1984.

Age Class	Sample Size	Mean Fork Length*			Sex Ratio Male:Female
		Male	Female	Sexes Combined	
1.2	384	603	0	603	All Male
1.3	1,118	805	822	812	1.2:1.0
1.4	1,049	977	929	<u>950</u>	<u>1.0:1.3</u>
Combined	2,551			837	1.3:1.0

* Fork length measured from mid-eye to fork of tail in millimeters.

Table 10. Chinook salmon escapement counts for northern Cook Inlet, 1976-1984.

Stream	1976*	1977*	1978*	1979	1980	1981	1982	1983	1984
<u>West Side</u>									
Alexander	5,412	9,246	5,854	6,215	nc	nc	2,546	3,755	4,620
Deshka	21,693	39,642	24,369	27,385	nc	nc	16,000	19,237	16,892
Lake	3,735	7,391	8,931	4,196	nc	nc	3,577	7,075	nc
Chuitna	1,984	1,981	1,130	1,246	nc	1,362	3,438	4,043	2,845
Theodore	1,032	2,263	547	512	nc	535	1,368	1,519	1,251
Lewis	380	454	561	546	nc	560	606	nc	947
Talachulitna	1,319	1,856	1,375	1,648	nc	2,025	3,101	10,014	6,138
Olson	247	1,229	94	17	nc	116	188	nc	nc
Coal	17	nc	1,551	178	nc	223	250	nc	nc
Red	nc	1,511	385	nc	nc	749	nc	nc	nc
Straight	59	24	108	nc	nc	126	383	nc	nc
Nikolai	11	143	nc	nc	nc	26	520	nc	nc
Bishop	12	468	nc	30	nc	174	387	nc	nc
Peters/Martin Creek	2,280	4,102	1,335	nc	nc	nc	nc	2,272	324
Cache Creek	61	100	nc	nc	nc	nc	nc	497	nc
Totals	38,242	70,410	46,240	41,973	0	5,896	32,364	48,412	33,017
<u>East Side</u>									
Willow	1,660	1,065	1,166	848	nc	991	592	777	2,789
Deception	nc	nc	495	239	nc	366	229	121	675
Montana	1,445	1,443	881	1,094	nc	814	887	1,641	2,309
Moose	116	153	237	253	nc	239	407	452	541
Kashwitna (NF)	203	236	362	457	nc	557	156	297	111
Little Willow	833	598	436	327	nc	459	316	1,042	nc
Sheep	455	630	1,209	778	nc	1,013	527	975	1,028
Goose	160	133	283	nc	nc	262	140	477	258
Indian	537	393	114	386	nc	422	1,050	1,193	1,456
Portage	702	374	140	190	nc	659	1,111	3,140	2,341

Table 10 (cont.). Chinook salmon escapement counts for northern Cook Inlet, 1976-1984.

Stream	1976*	1977*	1978*	1979	1980	1981	1982	1983	1984
<u>East Side</u>									
Chunilna	1,237	769	997	864	nc	nc	982	938	1,520
Prairie	6,513	5,790	5,154	nc	nc	nc	3,844	3,200	9,000
Chulitna (EF)	112	168	59	nc	nc	nc	119	nc	nc
Chulitna (MF)	1,870	1,782	900	nc	nc	nc	644	3,845	4,191
Chulitna	<u>124</u>	<u>229</u>	<u>62</u>	<u>nc</u>	<u>nc</u>	<u>nc</u>	<u>100</u>	<u>213</u>	<u>nc</u>
Totals	15,967	13,763	12,495	5,436	0	5,782	11,104	18,311	26,219
Combined Totals	54,209	84,173	58,735	47,409	0	11,678	43,468	66,723	59,236

* No sport fishery 1976-1978.

nc No count was conducted

NF = North fork

EF = East fork

MF = Middle fork

Table 11. Chinook salmon observed and estimated escapement counts for northern Cook Inlet, 1973-1984.

Year	Observed Escapement Counts	Estimated Count
1973	13,615	15,000
1974	12,548	15,000
1975	9,209	11,500
1976	54,209	71,200
1977	84,173	118,600
1978	58,735	81,200
1979	47,409	77,200
1980	nc	nc
1981*	11,678	nc
1982	43,468	82,800
1983	67,723	91,800
1984	60,059	94,000

* Partial count.

nc No count available.

Due to budget constraints and poor counting conditions, escapement counts were only conducted on 18 of the expected 22 streams.

Management Recommendations

The area staff did not submit any proposals to the Board of Fisheries to change the present chinook salmon regulations.

The Board of Fisheries also did not adopt any new chinook salmon sport fish regulation changes.

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